

HST Spectro-imaging of Jupiter's Aurorae in Relation with Galileo In-situ Measurements

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High latitude particle precipitation from the magnetosphere causes collisional excitation of the major atmospheric constituents, H and H₂, and gives rise to FUV auroral emissions. The auroral pattern is the 2-D projection of active regions in the magnetosphere along magnetic field lines. By contrast, the spectral characteristics of the emission bear the signature of the precipitating particles and of the auroral atmospheric structure.

High spatial resolution images of the FUV Jovian aurorae in the H₂ Lyman bands near 1550 Å obtained with the HST Faint Object Camera have permitted to identify specific auroral features at various latitudes and longitudes, magnetically connected to different regions in the Jovian magnetosphere. GHRS spectra of the H Lyman α line and of the H₂ Lyman and Werner bands at various spectral resolution show differences in the spectral diagnostic obtained in each of these regions.

Similar observations, combining images and spectra from the auroral atmosphere of Jupiter are designed to be taken in september 1996, at the footprint of magnetic field lines passing through the Galileo spacecraft while it is on the dayside magnetosphere, in order to correlate the diagnostics of the auroral emission with simultaneous in-situ particle and field measurements.

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